

CLAIMS

What is claimed is:

- 1 1. An image encoder engine for encoding an image, comprising:
2 an image decomposer for decomposing the image into a header and at
3 least one image block, each image block having a set of image elements and
4 each image element having an original image data value;
5 at least one block encoder for receiving each image block and for
6 compressing each image block into an encoded image block by associating
7 each original image data value of the image element with an index to a
8 derived image data value in a set of quantized image data values; and
9 an encoded image composer coupled to the block encoder for ordering
10 the encoded image blocks into a data file.
- 1 2. The image encoder engine of claim 1 further comprising a header
2 converter coupled to the image decomposer for converting the header into a
3 modified header.
- 1 3. The image encoder engine of claim 2 wherein the encoded image
2 composer orders the encoded image block and the modified header into a
3 data file.
- 1 4. The image encoder engine of claim 1 wherein the block encoder further
2 comprises a selection module for computing a set of parameters from the
3 image data values of the set of image elements.
- 1 5. The image encoder engine of claim 1 wherein the block encoder further
2 comprises a codeword generation module for generating at least one
3 codeword.

1 6. The image encoder engine of claim 1 wherein the block encoder further
2 comprises a construction module for generating the set of quantized image
3 data values including at least one codeword and at least one derived image
4 data value.

1 7. The image encoder engine of claim 1 wherein the block encoder further
2 comprises a block type module for selecting an identifiable block type for the
3 image block.

1 8. An image decoder engine for decoding an encoded image data file,
2 comprising:
3 an encoded image decomposer for decomposing the encoded image
4 data file into a modified header and at least one compressed image block,
5 each image block having at least one associated codeword and a plurality of
6 image elements associated with an index value;
7 at least one block decoder coupled to the encoded image decomposer
8 for decompressing the at least one compressed image block into at least one
9 decompressed image block by generating a set of quantized image data
10 values and mapping the index value to a quantized image data value from the
11 set of quantized image data values; and
12 an image composer for ordering the at least one decompressed image
13 blocks in an output data file.

1 9. The image decoder engine of claim 8 wherein the set of quantized image
2 data values include the at least one codeword and at least one image data value
3 derived from the at least one codeword.

1 10. The image decoder engine of claim 8 further comprising a header converter
2 coupled to the encoded image decomposer for converting the modified header into
3 an output header.

1 11. The image decoder engine of claim 10 wherein the image composer orders
2 the at least one decompressed image block and the output header into a data file.

1 12. The image decoder engine of claim 8 wherein the at least one block decoder
2 further comprises a block type detector for selecting a block type for each of the at
3 least one compressed image block.

1 13. The image decoder engine of claim 8 wherein the at least one block decoder
2 further comprises a decoder for decompressing each of the at least one compressed
3 image block based on a block type.

1 14. The image decoder engine of claim 8 wherein the at least one block decoder
2 further comprises an output selector for outputting the at least one decompressed
3 image block.

1 15. A method for fixed-rate block-based image compression of an original image,
2 comprising the steps of:

3 decomposing the original image into a header and a plurality of image blocks
4 each having a set of image elements with an original image data value;

5 computing at least one codeword from the original image data value for the
6 set of image elements;

7 generating a set of quantized image data values including the at least one
8 codeword and at least one image value derived from the at least one codeword; and

9 mapping the original image data value to one of the quantized image data
10 values to produce an index value for each image element.

1 16. The method of claim 15 further comprising outputting an encoded image
2 data file.

1 17. The method of claim 15 further comprising the step of converting the header
2 into a modified header.

1 18. The method of claim 17 further comprising the step of composing the
2 modified header and encoded image blocks into the encoded image data file.

1 19. A machine readable medium having embodied thereon a program being
2 executable by a machine to perform method steps for fixed-rate block-based image
3 compression of an original image, the method steps comprising:
4 decomposing the original image into a header and a plurality of image blocks
5 each having a set of image elements with an original image data value;
6 computing at least one codeword from the original image data value for the
7 set of image elements;
8 generating a set of quantized image data values including the at least one
9 codeword and at least one image value derived from the at least one codeword; and
10 mapping the original image data value to one of the quantized image data
11 values to produce an index value for each image element.

1 20. The machine readable medium of claim 19 further comprising the method of
2 outputting an encoded image data file.

1 21. An image encoder system for encoding an original image, comprising:
2 means for decomposing the original image into a header and a plurality of
3 image blocks each having a set of image elements with an original image data value;
4 means for computing at least one codeword from the original image data
5 value for the set of image elements;
6 means for generating a set of quantized image data values including the at
7 least one codeword and at least one image value derived from the at least one
8 codeword; and
9 means for mapping the original image data value to one of the quantized
10 image data values to produce an index value for each image element.

1 22. The image encoder system of claim 21 further comprising means for
2 outputting an encoded image data file.

1 23. A method for fixed-rate block-based image decompression of an encoded
 2 image, comprising the steps of:
 3 decomposing the encoded image of into a modified header and a plurality of
 4 encoded image blocks having at least one codeword and a plurality of image
 5 elements associated with an index value;
 6 generating a set of quantized image data values including the at least one
 7 codeword and at least one image value derived from the at least one codeword; and
 8 mapping the index value for each image element to one of the quantized
 9 image data values.

1 24. The method of claim 23 further comprising outputting a decoded image data
 2 file.

1 25. The method of claim 23 further comprising the step of converting the
 2 modified header into an output header.

1 26. The method of claim 25 further comprising the step of composing the output
 2 header and decoded image blocks into the decoded image data file.

1 27. A machine readable medium having embodied thereon a program being
 2 executable by a machine to perform method steps for fixed-rate block-based image
 3 decompression of an encoded image, the method steps comprising:
 4 decomposing the encoded image data file into a modified header and a
 5 plurality of encoded image blocks having at least one codeword and a plurality of
 6 image elements associated with an index value;
 7 generating a set of quantized image data values including the at least one
 8 codeword and at least one image value derived from the at least one codeword; and
 9 mapping the index value for each image element to one of the quantized
 10 image data values.

1 28. The machine readable medium of claim 27 further comprising the method of
2 outputting a decoded image data file.

1 29. An image decoder engine for decoding an encoded image data file,
2 comprising
3 means for decomposing the encoded image data file into a modified header
4 and a plurality of encoded image blocks having at least one codeword and a
5 plurality of image elements associated with an index value;
6 means for generating a set of quantized image data values including the at
7 least one codeword and at least one image value derived from the at least one
8 codeword; and
9 means for mapping the index value for each image element to one of the
10 quantized image data values.

1 30. The image decoder engine of claim 29 further comprising means for
2 outputting a decoded image data file.